

Appl. No. : 09/810,889
Filed : March 16, 2001

REMARKS

Claim 1 has been amended. Claims 14-33 are cancelled. New claims 34-35 are added. Claims 1-13 and 34-35 are before the Examiner. Amendments have been made to clarify the claimed subject matter. Support for the amendments is found in the existing claims and the specification as discussed below. Accordingly, the amendments do not constitute the addition of new matter. Applicant respectfully requests the entry of the amendments and reconsideration of the application in view of the amendments and the following remarks.

Restriction/ Election Requirement

Applicants hereby affirm election of Group I, claims 1-13. This election is made without traverse.

Rejection under 35 U.S.C. § 102(b)

Claims 1-3, 7, 8, 10, 11, and 13 are rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 3,645,696 to Iannacone, et al.

The Examiner states that Iannacone et al. teach a method for colorimetrically determining the presence of aldehydes comprising reacting an aldehyde-containing sample with MBTH to form a visually observable color.

It is not disputed that the chemical reactions upon which the claimed method was based were known at the time of the claimed invention. However, the cited art does not teach Applicants' claimed method of utilizing this chemistry.

The prior art is drawn to measurement of trace levels of aldehyde. Iannacone et al. address the problem of a need for an ethylene glycol testing method to indicate the first detectable concentration of ethylene glycol (see col. 1, lines 46-48). That is, in the prior art, the concentration of the aldehyde is the limiting factor and the MBTH is in excess. In contrast, in the situation where the aldehyde concentration is high, as in the case of disinfectants, the prior art methods as represented by Iannacone et al. do not work well because inconvenient dilutions are necessary in order to get a good reading. This is discussed in the specification at page 1, lines 25-28. In order to overcome this problem, Applicants have provided a different set of method steps than what is taught in the prior art.

In the method of Iannacone, et al., the aldehyde is always below the point of interest because the MBTH is always in excess. In contrast to the method of Iannacone et al., in the presently claimed invention, the aldehyde may be above, below, or the same as the point of

Appl. No. : 09/810,889
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interest. As recited in claim 1, the amount of MBTH is the amount necessary "to produce an azine, wherein said amount is the amount of MBTH that reacts with the aldehyde to the point of interest." The MBTH concentration is just enough to neutralize the aldehyde at the point of interest (see present specification at page 6, lines 32-34). This avoids the need for dilutions when assaying at a high concentration of aldehyde which provides an advantage that is not taught by the cited prior art reference.

Claim 1 has been amended to clarify this point. Support for this amendment is found on page 6, second full paragraph, for example. In the case where the aldehyde is high, the MBTH is the limiting reagent and all of the color produced in the reaction comes from the formation of the azine by reaction of the aldehyde with the MBTH.

In the case where the aldehyde concentration is low, the MBTH still reacts with the aldehyde to form the azine. However, additional color is produced by the oxidation of MBTH and the reaction of the oxidized MBTH with the azine to produce a different color than when the aldehyde is in excess. When aldehyde is present in the test sample, the prior art always produces a blue color due to the formazan produced by the excess MBTH. In contrast, in Applicants' claimed method, the color of the azine is produced when the concentration of the aldehyde is at the point of interest or higher (at or above the point of interest) and the color of the formazan is produced when the concentration of the aldehyde is low (below the point of interest). Thus, by using a limited amount of MBTH to test the aldehyde around the point of interest, less aldehyde produces more blue color and more aldehyde produces less blue color (see present specification, page 6, lines 19-21). This differs from the method taught by the prior art.

Applicants' method provides a convenient pass/fail assay to determine whether or not the aldehyde in a test sample is above or below a critical cutoff concentration. The assay is passed when the aldehyde concentration is at or above the point of interest and a first color is produced which is the color of the azine. The assay is failed when the aldehyde is below the point of interest and the color is the color of the formazan. In summary, it is respectfully submitted that the method of the present invention is not taught by Iannacone, et al.

In view of Applicants' amendments and arguments, reconsideration and withdrawal of this ground of rejection is respectfully requested.

Appl. No. : 09/810,889
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Rejection under 35 U.S.C. § 103(a)

Claims 4-6 and 12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Iannacone et al. in view of a Marine Chemistry article authored by Eberhardt, et al.

Eberhardt et al is cited for the teaching that MBTH is not specific but reacts with other aldehydes including glutaraldehyde.

However, Eberhardt et al. does not correct the deficiencies of Iannacone, et al. discussed above. The discussion above is incorporated herein by reference. Neither Iannacone et al. nor Eberhardt, et al. teach or suggest Applicants' claimed invention.

As discussed above, it is not disputed that the chemical reactions upon which the claimed method was based were known at the time of the claimed invention. However, the cited art does not teach or suggest Applicants' method as presently claimed.

In the prior art, the aldehyde is the limiting reagent and the MBTH is provided in excess. This means that in the situation where the aldehyde concentration is high, as in the case of disinfectants, dilutions are necessary in order to get a good reading as discussed in the specification at page 1, lines 25-28. In contrast, in the present case, the concentration of the MBTH is the amount necessary "to produce an azine, wherein said amount is the amount of MBTH that reacts with the aldehyde to the point of interest" (claim 1). The MBTH concentration is just enough to neutralize the aldehyde at the point of interest (see present specification at page 6, lines 32-34). This avoids the need for dilutions when assaying at a high concentration of aldehyde which provides an advantage that is neither taught nor suggested by the cited prior art.

Claim 1 has been amended to clarify this point. In the case where the aldehyde is high, the MBTH is the limiting reagent and all of the color produced in the reaction comes from the formation of the azine by reaction of the aldehyde with the MBTH. In the case where the aldehyde concentration is low, the MBTH still reacts with the aldehyde to form the azine. However, additional color is produced by the oxidation of MBTH and the reaction of the oxidized MBTH with the azine to produce a different color than when the aldehyde is in excess.

When aldehyde is present in the test sample of the prior art, the assay always produces a blue color due to the formazan produced by the excess MBTH. In contrast, in Applicants' claimed method, the color of the azine is produced when the concentration of the aldehyde is at the point of interest or higher (at or above the point of interest) and the color of the formazan is

Appl. No. : 09/810,889
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produced when the concentration of the aldehyde is low (below the point of interest). Thus, by using a limited amount of MBTH to test the aldehyde around the point of interest, less aldehyde produces more blue color and more aldehyde produces less blue color (see present specification, page 6, lines 19-21). This differs from the method taught by the prior art.

Applicants' method provides a convenient pass/fail assay to determine whether or not the aldehyde in a test sample is above or below a critical cutoff concentration. The assay is passed when the aldehyde concentration is at or above the point of interest and a first color is produced which is the color of the azine. The assay is failed when the aldehyde is below the point of interest and the color is the color of the formazan.

Thus, neither Iannacone et al nor Eberhardt et al. teach or suggest adjustment of the MBTH to correspond to the desired aldehyde concentration. Applicants' claimed invention provides a convenient pass/fail assay to determine whether or not the aldehyde in a test sample is above or below a critical cutoff concentration. Applicants' claimed invention is particularly useful for determination of aldehyde when the aldehyde concentration is high. This problem is not addressed by the cited references. The method steps as claimed are neither taught nor suggested by the prior art references.

In view of Applicants' amendments and arguments, reconsideration and withdrawal of this ground of rejection is respectfully requested.

Claim 9 is rejected under 35 U.S.C. § 103(a) as unpatentable over Iannacone et al. in view of U.S. Patent No. 4, 703, 763 to McAlister, et al.

The Examiner has rejected claim 9 as being unpatentable over Iannacone et al. in view of McAlister, et al. The Examiner asserts that it would have been obvious to one of ordinary skill in the art to use the device of McAlister, et al. to measuring an exact amount of test sample in carrying out the method of Iannacone et al. However, since claim 9 depends ultimately from claim 1, which is neither taught nor suggested by Iannacone, et al., the invention defined in claim 9 is also patentably distinguished from the references, alone or in combination. Applicants respectfully request the withdrawal of the rejection.

CONCLUSION

In view of Applicants' amendments to the claims and the foregoing Remarks, it is respectfully submitted that the present application is in condition for allowance. Should the Examiner have any remaining concerns which might prevent the prompt allowance of the

Appl. No. : 09/810,889
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application, the Examiner is respectfully invited to contact the undersigned at the telephone number appearing below.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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